

Applicant: Peter A. Warren
For: FLEXURE AND PRECISION CLAMP

1 1. A flexure comprising:
2 a plurality of plies of composite material consolidated everywhere
3 except at at least one predefined region where preselected adjacent plies are purposefully
4 delaminated so they can move relative to each other when the flexure is bent.

1 2. The flexure of claim 1 in which the plies are grouped together in a number
2 of consolidated layers except at the predefined region where there is no consolidation
3 between adjacent layers.

1 3. The flexure of claim 1 in which there are a number of consolidated layers
2 each including a plurality of plies except at the predefined region where there are less layers
3 and no consolidation between adjacent layers.

1 4. The flexure of claim 1 in which the flexure is substantially longer than it is
2 thick.

1 5. The flexure of claim 4 in which the flexure is substantially longer than it is
2 wide.

1 6. The flexure of claim 5 in which the flexure is substantially longer than it is
2 thick and substantially longer than it is wide.

20090901-0300

1 7. The flexure of claim 1 in which the plies include axial carbon fibers
2 embedded in a resin matrix.

1 8. A method of manufacturing a flexure, the method comprising:
2 forming a plurality of composite plies into a number of layers;
3 placing between two adjacent layers a non-impregnatable material at
4 a predefined region therebetween which interrupts another layer disposed between the two
5 adjacent layers;
6 applying heat and pressure to consolidate all the layers except at the
7 predefined region; and
8 removing the non-impregnatable material.

1 9. The method of claim 8 in which the layers include plies of axial carbon
2 fibers embedded in a resin matrix.

1 10. The method of claim 8 in which each layer is at least partially consolidated
2 except the interrupted layer which is a prepreg.

1 11. The method of claim 8 in which the non-impregnatable material is a number
2 of metallic shims.

20250101 16:36:00

- 1 12. A flexure comprising:
- 2 a number of plies of composite material consolidated everywhere
- 3 except at at least one predefined region where preselected adjacent plies are purposefully
- 4 delaminated so they can move relative to each other when the flexure is bent, the plies
- 5 group together in a number of consolidated layers except at the predefined region where
- 6 there is no consolidation between adjacent layers.

20250715 15:00

1 13. A flexure comprising:
2 a plurality of plies of composite material consolidated everywhere
3 except at at least one predefined region where preselected adjacent plies are purposely
4 delaminated so that they can move relative to each other when the flexure is bent, the
5 flexure including a number of consolidated layers each including a plurality of plies except
6 at the predefined region where there are less layers and no consolidation between adjacent
7 layers.

20250706 16:00:00

1 14. A latch assembly comprising:
2 a tang; and
3 a clamp which receives the tang, the clamp including:
4 a base; and
5 at least two flexures extending from the base spaced from
6 each other defining opposing jaws which, when flexed away
7 from each other, accept the tang therebetween and which
8 when released secure the tang in the clamp between the jaws.

1 15. The latch assembly of claim 14 in which each flexure includes a plurality of
2 plies of composite material consolidated everywhere except at at least one predefined region
3 where preselected adjacent plies are purposely delaminated so that they can move relative to
4 each other when the flexure is bent.

1 16. The latch assembly of claim 14 in which each clamp jaw includes a number
2 of flexures.

1 17. The latch assembly of claim 16 in which each clamp jaw includes an end cap
2 secured to the terminal ends of the plurality of flexures.

1 18. The latch assembly of claim 16 in which each clamp jaw includes at least
2 two spaced flexures.

1 19. The latch assembly of claim 18 in which each clamp jaw includes two sets

2 of spaced flexures.

1 20. The latch assembly of claim 17 in which each clamp jaw includes a bearing
2 attached thereto.

1 21. The latch assembly of claim 14 further including a spreader assembly which
2 urges the jaws apart.

1 22. The latch assembly of claim 14 in which the tang includes at least two
2 spaced apart flexures.

2025-07-16 16:00:00

23. A composite flexure.

FM-196J
KCT:dg